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ABSTRACT

The varying perspectives of self, as determined by distinct or discrete situations and individual perceptions within a multitrait-multimethod framework, were tested, and evidence for the validity of the measures was found. Six hundred ninety-eight students in grades 1-12 were randomly selected from suburban classrooms in the Northeast and administered the Affective Perception Inventory (API). The API consists of nine scales which measure self concept as a person and student, in six specific classroom disciplines (English, mathematics, science, social studies, the arts, and physical education), and in school and toward important figures in school. There were two peer-raters for each self-rater analyzed, in addition to teacher-raters at every grade level. A multitrait-multimethod matrix was obtained for determining reliability, and discriminant and convergent validity. The pattern that emerged from the results can be summarized as follows: (1) internal consistency on all scales; (2) respectable convergent validity between self and peers, with less agreement between peers and teachers; (3) differential discriminant validity; and (4) varying self-pictures developing from individualized configurations of the encoding process in the brain. (RL)

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Nomological Research in Self-Perception: Implications for Construct Validity in a Multitrait-Multimethod Matrix Design

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ABSTRACT

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Nine different self scales were administered to children, their peers and teachers. With a multitrait-multimethod matrix formulation, the results indicated general differentiation on the nine scales, suggesting situation-dependent and divergent self-pictures. Interpersonal congruence was found most often between self-perceptions and peer-perceptions.

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Nomological research appears to have taken hold in the area of self concept (e.g., Marx & Winne, 1978). Although within-network studies which define and clarify the construct of self concept should precede inter-variable research (Wylie; 1974), studies of the between-network variety (i.e., comparing self-concept scores with some other variable) are more plentiful than those of within-network design (i.e., subunits of the self construct). The few of the latter type which are available have not seemed to have distinguished among facets of a self concept. For example, a study by Winne, Marx, and Taylor (1977) discovered convergence of physical, social, and academic self concept rather than discriminant validity. Other studies have attempted to establish the self concept as a unitary phenomenon (cf., Loevinger, Rosenberg & Simmons, 1973). Yet, as others have indicated (e.g., Scheirer & Kraut, 1979; Soares & Soares, 1977), the concept of self should be seen as a complex construct, partly because it has evaluative and affective components.

On the other hand, attempts to present a hierarchical structure of self have not thus far been convincing (Shavelson, Hubner, & Stanton, 1976), perhaps because the self cannot be neatly compartmentalized into situation-dependent and prioritized behaviors which are descriptive of the construct. Thus, one of the reasons for not finding discriminant evidence

may very well be because the theoretical constructs are not themselves discriminating. The present study was designed to test a differentiating theoretical foundation for building cognitive images, engaging the environment, and developing concepts of reality, as determined by individual perceptions and by knowledge of the mind's capacity as an information-processing and pattern-detecting apparatus. A related theoretical direction has previously been proposed, extrapolating models of intelligence to self theory (Soares & Soares, 1977).

Spearman (1927) initially developed a theory of intelligence as predominantly a generalized function. He believed that all individuals possessed this "g" factor in various degrees, as it was common to all mental activity. Spearman then postulated specific factors which would be involved in different tasks. Therefore, the g factor provided the most crucial explanation of an individual's level of intelligence, and the s factors supplied the differential dimensions of the individual's level of mental functioning. Does the self have this same generalized function?

A second approach is suggested by Thurstone's primary mental abilities (1943) in that intelligence is believed to be an expression of several highly specific factors. These factors may be relatively independent of one another, although experimentation has often revealed evidence for a basic general factor in addition to the semi-autonomous specific factors. Is the self an expression of several highly specific factors?

The third system of thinking provides a multi-dimensional model, as espoused by Thorndike (1927). He believed that intelligence consisted of highly specific processes and that, if a high degree of relationship is

is indicated among any of these processes, mental functioning on the basis of common elements would be indicated. Some research seems to point toward perhaps 80 separate intellectual abilities with a possible 40 more as predicted by a comprehensive unified theory. Guilford (1959, 1968) suggests a taxonomic model, which conceptualizes a three-way classification involving operation or process, content or materials, and products by way of factor analytic methods. Cattell (1963) has taken this multi-factor view of the intellect one step further in distinguishing crystallized and fluid intelligence, wherein the former refers to perceiving relations via culturally acquired skills versus the individuation of learning experiences in the latter.

Piaget (1952) adds still another dimension to the formulation of intelligence. The organism's schemes for understanding the world increasingly become transformations carried out mentally without physical action--i.e., "interiorized actions."

To extrapolate a set of principles which had been promulgated in one area of human knowledge to another with the expressed purpose of enlightenment, or at least explanation, is not without its dangers. However, since the mental operations involved in developing a concept of self are similar to those involved in developing configurations, cognition, evaluative abilities, divergent thinking, and the like, the bridging process may not be as tenuous as one would at first believe.

In relating this discussion on intelligence to self-perceptions research, the authors are suggesting a differentiating theoretical foundation--one that goes beyond the obvious base of a general self concept in combination with a hierarchical paradigm and one that includes a processing thrust--for building

cognitive images, engaging the environment, and developing conceptions of reality.

Piaget typically indicates that affectivity provides an energizer in its parallel growth with cognitive development, though it "does not modify the cognitive structure" (Evans, 1973, p. 7). Furthermore, since cognitive structures are forms of organization of, and adaptation to, the perceived environment (Piaget, 1952), it would seem logical to interact the concepts of intelligence and self.

The relevance to more recent theories of cognition (e.g., Shiffrin & Schneider, 1977; Sternberg, 1975) is essential in order to postulate a more insightful approach to understanding of the self. The self concept may very well correspond to an encoding process which operates through a set of associative connections in long-term memory (Hull & Levy, 1979).

The present study was designed to test the varying perspectives of self, as determined by distinct or discrete situations and individual perceptions, within a multitrait-multimethod framework, as designed by Campbell and Fiske (1959), and to provide evidence for the validity of the measures in the form suggested by Michael, Pless, and Lee (1973).

METHOD

Subjects

From suburban classrooms in the Northeast, 698 students in grades one through twelve were randomly selected. There were two peer-raters for every student providing self-perceptions. Teachers at every grade level rated the same students.

Procedure

The subjects were administered the Affective Perception Inventory (API)--

an instrument which yields scores on self concept as a person and as a student, perception of self in six specific classroom disciplines (English, mathematics, science, social studies, the arts, and physical education), and finally perceptions of self in school and toward important figures in school (Soares & Soares, 1976).

Each of these nine scales was administered to the students with the primary-grade children having the items read to them. There were two peer-raters for each self-rater analyzed in addition to the teacher-raters, using corresponding items.

RESULTS

A multitrait-multimethod matrix was obtained for determining reliability, discriminant and convergent validity.

Monotrait-Monomethod Correlations (M-M).

The reliability coefficients are along the outside diagonal within parentheses. These were obtained from Rulon's split-half method (1939) which utilizes the variance of the differences between the scores on two test-halves for each individual and the variance of total scores:

$$r_{1I} = 1 - \frac{\sigma_d^2}{\sigma_x^2}$$

This formulation views chance error as represented in the difference between the split-halves. The variance of these differences, when divided by the total variance, takes into account the proportion of error variance. Finally, when this result is subtracted from one, the "true" variance is yielded.

In terms of the coefficients themselves, internal consistency seems operative. For the students, seven of the nine self-ratings indicated correlations of .81 or higher. None of the peer-rating coefficients was

was below .61; the lowest for the teacher-ratings was .65.

Monotrait-Heteromethod Correlations (M-H).

The validity coefficients are boxed and are indicated in the shorter diagonals (Table 1). In the comparison of self- and peer-ratings, the greatest agreement overall appeared on the School Perceptions (.76), and of the subject areas in particular, Mathematics Perceptions (.55); the lowest, on the Arts (.38). With self- and teacher-ratings, the highest correlations were found on Student Self (.74) and Language Arts (.50); the lowest again on the Arts (.30). When comparing the peer- with the teacher-ratings, the strongest relationship occurred on School (.80) and Language Arts (.57) and the weakest on the Arts (.26).

All M-H coefficients were larger than the median H-H correlations. When comparing the M-H coefficients with their corresponding H-H correlations arranged in a diamond design around the validity coefficients, almost all (the latter) are lower in value. For example, the coefficient of .50 for the interaction of self-ratings and peer-ratings on Scale #2 (Student Self) is higher than any of the four values surrounding it--that is, .32 (Self, Scale #2; Peers, Scale #1), .42 (Self, Scale #3; Peers, Scale #2), .45 (Self, Scale #2; Peers, Scale #3), and .33 (Self, Scale #1; Peers, Scale #2). The only exceptions are on Scale #1 for Self and Teachers (.37, which is below .50 for Self/Scale #2 and Teachers/Scale #1) and the .29 on Scale #4 (Mathematics) for Peers and Teachers, which is especially lower than the .39 for Peers/Scale #4 and Teachers/Scale #3. The higher M-H coefficients represent convergence at a moderate level in most cases. The interaction of Self and Peers was the most consistent and least dispersed of the three pairings.

Heterotrait-Monomethod Correlations (H-M).

These correlations are indicated in solid, outside triangles of Table 1. None of the self-peers M-H validity coefficients fell below the median correlations for either the self- or peer-ratings. Three of the nine self-teacher M-H coefficients were lower than the median H-M correlation for self-ratings--Scale #7 (Arts), Scale #8 (Physical Education), and Scale #9 (School). Four values of the peer-teacher interaction did fall considerably below the .38 of the peers H-M correlation--.29 (Scale #4/Math.), .28 (Scale #6/Social Studies), .26 (Scale #7/Arts), and .27 (Scale #8/Physical Education). Since Scales #7 and #8 are common in both cases, it would seem that these scales have little discriminant validity, possibly due in part to common method variance.

These is some confounding among the scales, but discriminant validity exists in most cases. The self-peers M-H coefficient, on Scale #2 is lower than the H-M correlation in only one instance--.66, Method (1) on Scales #2 and #3. The other exception for the interaction of self-peers is the .38 on Scale #7 when compared to .46 for Self/Scales #3 and #7. The H-M value on Scales #2 and #3 comes out higher again for peer-ratings (.63) when compared to the self-peers coefficient on Scale #2 (.50). There are two other isolated instances in the comparison of self-peers M-H coefficients with the H-M correlations within the peer-ratings: (1) the .62 for Scales #2 and #4; (2) the .48 for Scales #3 and #6. The most consistent confounding occurs with Scale #9. The correlations of .59, .60, .52, and .51 for the peers H-M are higher than the respective coefficients from the M-H of the self- and peer-ratings.

This situation continues with the H-M correlations for the teacher-ratings on Scale #9 with #2 and #3 as well as the clustering of Scales #1, #2, and #3--all of the values ranging from .70 to .73. As indicated, however, the discriminant validity would seem to be operative since the H-M correlations: (1) for self-ratings are moderate to low in all but one case; (2) for peer-ratings are moderate to low in most cases except for Scale #2 with Scales #3 and #4 and for Scale #9; (3) for teacher-ratings are moderate to low in most cases except with the clustering of Scales #1, #2, #3, and also again with Scale #9.

Heterotrait-Heteromethod Correlations (H-H).

Construct validity requires lower H-H correlations than M-H values. For the most part, such is the case, as noted in the broken, inside triangles of Table 1. There is some confounding again, however, on Scale #9 with a few of the other scales. For example, in the comparison of self and peers, the M-H coefficient (.49) on Scale #3 is lower than the correlation between Self/Scale #9 and Peers/Scale #3 (.53); also, the .39 on Scale #6 for self and peers as opposed to the .42 for Self/Scale #9 and Peers/Scale #6. Other exceptions can be found in the comparison of peers and teachers: (1) Scale #1 (.35) as contrasted with the .52 at the end of that row and the .46 at the bottom of the corresponding column; (2) Scale #2 (.40) as contrasted with the .62 and .51 for the respective row and column.

DISCUSSION

The pattern that emerges from the results can be summarized as follows:

1. Internal consistency on all scales.
2. Respectable convergent validity between Self and Peers on Self Concept, Student Self, Language Arts, Mathematics, Science, and

School; and between Self and Teachers on Student Self, Language Arts, Mathematics, Science, and Social Studies. There was less agreement between peers and teachers, especially noted on Language Arts and School. This result has been previously reported on (Soares & Soares, 1978), indicating a hierarchy of rater-impact ranging from parents (highest significant others), to peers, and lastly to teachers.

3. Differential discriminant validity in that three varied pictures became salient.
   a. A frequent clustering of Self Concept, Student Self, Language Arts, and School Perceptions quite distinct from (b) below.
   b. Divergence of Mathematics and Science (and sometimes Social Studies) from each other as well as from (a) above and (c) below.
   c. A fuzziness implicit in the Arts and Physical Education scales in that low correlations existed for both convergent and discriminant validation, suggesting inconsistent and wide dispersion.
4. Varying self-pictures developing from individualized configurations of the encoding process in the brain.

Self-perceptions would seem to be varied and multiple, providing congruent and differentiating dynamics both horizontally or interpersonally and vertically or intrapersonally. The genesis of this position suggests an interfacing of cognitive dimensions and behavioral determinants. Although future research requires multilevel directives, including creative theory-development and analytical paradigms, the evidence so far accumulated suggests

not a general self concept influencing all an individual's behavior and not a hierarchical self concept which subsumes several role-descriptive selves, but rather differentiating self-perceptions--varying in breadth and depth--which develop independently according to experiences, reinforcement, and individualized conceptualizations by way of long-term memory.

Bibliography

Campbell, D. T., & Fiske, D. W. Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 1959, 56, 81-105.

Cattell, R. B. Theory of fluid and crystallized intelligence: A critical experiment. Journal of Educational Psychology, 1963, 54, 1-22.

Evans, R. L. Jean Piaget: The man and his ideas. New York: E. P. Dutton, 1973.

Gage, N. L., & Berliner, D. C. Educational psychology. Chicago: Rand McNally, 1975.

Guilford, J. P. Three faces of intellect. American Psychologist, 1959, 14, 469-479.

Guilford, J. P. Intelligence has three facets. Science, 1968, 160, 615-620.

Hull, J. G., & Levy, A. S. The organizational functions of the self. Journal of Personality and Social Psychology, 1979, 37, 756-768.

Loevinger, J. The meaning and measurement of ego development. American Psychologist, 1966, 21, 195-206.

Marx, R. W., & Winne, P. H. Construct interpretations of three self-concept inventories. American Educational Research Journal, 1978, 15, 99-109.

Michael, J., Pless, A., & Lee, Y. B. A comparison of the self-report and the observed report in the measurement of the self-concept: Implications for construct validity. Educational and Psychological Measurement, 1973, 33, 433-439.

Piaget, J. The origins of intelligence in the child. New York: International Universities Press, 1952.

Rosenberg, M. & Simmons, R. G. Black and white self-esteem: The urban school child. Washington, D.C.: American Sociological Association, 1973.

Rulon, P. J. A simplified procedure for determining the reliability of a test of split halves. Harvard Educational Review, 1939, 9, 99-103.

Scheirer, M. A., & Kraut, R. E. Increasing educational achievement via self concept change. Review of Educational Research, 1979, 49, 131-149.

Shavelson, R. J., Hubner, J. J., & Stanton, G. C. Self-concept: Validation of construct interpretations. Review of Educational Research, 1976, 46, 407-441.

Shiffrin, R. M., & Schneider, W. Controlled and automatic information processing: II. Perceptual learning, automatic attending, and a general theory. Psychological Review, 1977, 84, 127-190.

Soares, L. M., & Soares, A. T. The self concept: Mini, maxi, multi? New York: Annual Meeting of the American Educational Research Association, 1977.

Soares, A. T., & Soares, L. M. The API Test Manual. Trumbull, Conn.: ALSO Corporation, 1976.

Spearman, C. The abilities of man. New York: Macmillan, 1927.

Sternberg, S. Memory scanning: New findings and current controversies. Quarterly Journal of Experimental Psychology, 1975, 27, 1-32.

Thorndike, E. L. The measurement of intelligence. New York: Teachers College, Bureau of Publications, Columbia University, 1927.

Thurstone, L. L., & Thurstone, T. G. The Chicago tests of primary mental abilities: Manual of instructions. Chicago: Science Research Associates, 1943.

Winne, P. H., Marx, R. W., & Taylor, T. D. A multitrait-multimethod study of three self-concept inventories. Child Development, 1977, 48, 893-901.

Wylie, R. C. The self concept. (Vol. I). Lincoln, Nebraska: University of Nebraska Press, 1974.

Soares, L. M., & Soares, A. T. The rater differential in interpersonal perceptions: Implications for construct validity. Toronto, Ontario, Canada: Annual Convention of the American Psychological Association, 1978.

Table 1

Multitrait-Multimethod Matrix

		Method 1								
		1	2	3	4	5	6	7	8	9
Method 1										
Scale 1	1	(.94)								
	2	.47	(.79)							
	3	.44	.66	(.89)						
	4	.27	.38	.27	(.81)					
	5	.41	.35	.37	.37	(.88)				
	6	.38	.39	.33	.25	.33	(.88)			
	7	.25	.42	.46	.13	.33	.23	(.63)		
	8	.45	.35	.23	.24	.41	.29	.21	(.84)	
	9	.45	.41	.49	.40	.46	.38	.38	.35	(.83)
Method 2										
Scale 1	1	[.49]	.32	.23	.20	.30	.11	.03	.32	.38
	2	.33	[.50]	.42	.40	.38	.20	.03	.19	.48
	3	.12	.45	[.49]	.41	.27	.09	.14	.05	.53
	4	.17	.38	.29	[.55]	.31	.07	.11	.19	.52
	5	.17	.46	.30	.25	[.51]	.11	.01	.22	.33
	6	.25	.36	.43	.24	.20	[.39]	.18	.16	.42
	7	.09	.17	.15	.09	.04	.11	[.38]	.02	.26
	8	.15	.14	.22	.05	.05	.20	.09	[.44]	.19
	9	.34	.50	.42	.47	.36	.16	.26	.14	[.76]
Method 3										
Scale 1	1	[.37]	.50	.29	.03	.13	.21	.17	.24	.23
	2	.30	[.74]	.41	.06	.23	.20	.19	.21	.36
	3	.29	.43	[.50]	.10	.28	.30	.24	.19	.43
	4	.06	.28	.23	[.47]	.25	.09	.05	.20	.26
	5	.22	.42	.27	.23	[.47]	.17	.03	.06	.30
	6	.25	.27	.37	.22	.14	[.47]	.07	.03	.46
	7	.06	.08	.20	.10	.08	.12	[.30]	.16	.23
	8	.29	.34	.34	.16	.11	.12	.02	[.33]	.33
	9	.24	.29	.24	.04	.23	.13	.20	.35	[.34]

		Method 2								
		1	2	3	4	5	6	7	8	9
Scale 1	1	(.82)								
	2	.49	(.71)							
	3	.51	.63	(.80)						
	4	.51	.62	.42	(.85)					
	5	.27	.50	.27	.50	(.81)				
	6	.38	.52	.48	.53	.38	(.78)			
	7	.39	.36	.40	.35	.35	.34	(.61)		
	8	.27	.33	.25	.22	.32	.38	.30	(.69)	
	9	.31	.59	.60	.52	.31	.51	.26	.33	(.68)
Scale 1	1	[.35]	.36	.30	.03	.14	.15	.14	.07	.52
	2	.36	[.40]	.11	.08	.12	.25	.12	.08	.62
	3	.03	.40	[.57]	.39	.36	.13	.17	.02	.32
	4	.22	.16	.31	[.29]	.20	.18	.24	.02	.09
	5	.20	.28	.56	.13	[.36]	.26	.31	.38	.12
	6	.02	.03	.09	.05	.15	[.28]	.20	.17	.01
	7	.33	.09	.20	.11	.04	.20	[.26]	.17	.31
	8	.13	.27	.07	.26	.18	.20	.20	[.27]	.12
	9	.46	.51	.08	.21	.13	.22	.14	.11	[.80]

		Method 3								
		1	2	3	4	5	6	7	8	9
Scale 1	1	(.66)								
	2	.72	(.82)							
	3	.71	.73	(.87)						
	4	.09	.27	.31	(.86)					
	5	.14	.41	.45	.52	(.84)				
	6	.42	.46	.44	.13	.27	(.82)			
	7	.08	.04	.22	.10	.12	.20	(.66)		
	8	.28	.36	.29	.22	.14	.13	.03	(.81)	
	9	.48	.70	.70	.21	.21	.28	.11	.29	(.65)

KEY: Method 1--Self
Method 2--Peers
Method 3--Teachers

Scale 1--Self Concept
Scale 2--Student Self
Scale 3--Language Arts (English)
Scale 4--Mathematics
Scale 5--Science
Scale 6--Social Studies
Scale 7--The Arts
Scale 8--Physical Education
Scale 9--School

Table 2

Summary of Multitrait-Multimethod Coefficients

Type	Max	Min	Median
Monotrait-Monomethod			
Self	.94	.63	.84
Peers	.85	.61	.78
Teachers	.87	.65	.82
Monotrait-Heteromethod			
Self/Peers	.76	.38	.49
Self/Teachers	.74	.30	47
Peers/Teachers	.80	.26	.35
Heterotrait-Monomethod			
Self	.66	.13	.37
Peers	.63	.22	.38
Teachers	.73	.03	.28
Heterotrait-Heteromethod			
Self/Peers	.53	.01	.21
Self/Teachers	.50	.02	.23
Peers/Teachers	.62	.01	.18